

# Tri-variate $C^1$ elements for curved domains

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Efficiently modeling differentiable fields over general box-complexes (a collection of 3-dimensional boxes forming an unstructured hexahedral mesh) is of interest in areas ranging from medical scientific data visualization to solving higher-order differential equations, including fluid flow.

For general box-complexes there is to date no simple prescription to join the corresponding polynomial pieces with more than continuity. This poster presents the first refinable  $C^1$  spline space for general box-complexes guaranteeing smoothness across irregular points and irregular edges and enabling the solution of 4th order pdes on curved domains.